

**REMARKS**

The present amendment is in response to the Office Action received on July 12, 2004, in which Claims 1 through 31 were rejected. Applicant has thoroughly reviewed the outstanding Office Action including the Examiner's remarks and the reference cited therein. The following remarks are believed to be fully responsive to the Office Action and render all claims at issue patentably distinguishable over the cited references.

Reconsideration and withdrawal of the rejections set forth in the Office Action dated July 12, 2004 is respectfully requested.

**I. Claim Rejections - 35 U.S.C. § 112**

Claims 6, 20, and 29 have been amended to correct the errors noted by the Examiner. In Claim 6, "said plurality of low-order low-pass filters" is corrected to be "said plurality of high-order low-pass filters." The limitation "by using a plurality of filters" is added to the end of Claim 20 so as to provide an antecedent basis for "said plurality of filters" in Claim 21. Finally, in Claim 29, "said interpolator is a time sharing interpolator" is deleted.

**II. Claim Rejections - 35 U.S.C. § 103**

In the Office Action, the Examiner rejected Claims 1-4, 8, 12, 19, 23, 27, and 31 under 35 U.S.C. 103(a) as being unpatentable over Yoon (U.S. Patent No. 6,433,719 B2) in combination with Lim (U.S. Patent No. 6,583,662 B1) and Walden et al. (U.S. Patent No. 5,841,382)

As further detailed below, Yoon discloses a digital to analog (D/A) converter. In contrast, Claims 1, 5, 9, and 16 provide systems of multi-channel shared resistor-string digital-to-analog converters which comprise a multi-channel shared resistor-string digital-to-analog converters and a plurality of low-pass filters, respectively. According to Claims 1, 5, 9, and 16 and the specification of the present application, the filters are applied to attenuate the residue images of out-of-band noise in the multi-channel analog audio output in order to complete the multi-channel analog output

reconstruction (see "Detailed Description", paragraph 2). This is one of the major purposes of the present invention, and the structure of the claimed systems are not shown by the DA transformer disclosed by Yoon because the Yoon DA transformer does not include means for filtering output signals.

Instead, the Examiner argues that the DA transformer of Yoon combined with the filter disclosed by Lim and the switch disclosed by Walden et al. may make the claims obvious to one having ordinary skill in the art. The filter disclosed in Lim is used in the field of high speed data communications (such as ADSL) and that filter is merely applied to smooth a conventional DA converter instead of the multi-channel shared resistor-string DA converters. In contrast, the systems of Claims 1, 5, 9, and 16 are used to solve the problem that the resistor-string DA converter is unsuitable in conventional high resolution DA converter. Both of cited references fail to teach the motivation to combine these elements. Further neither reference teaches the goal of attenuating the residue images of out-of-band noise in the multi-channel analog audio output. The combination of the cited references fails to achieve the purpose, function, and structure of the claimed invention.

Further, Walden et al. only discloses a testing circuit for DA converters. As we can see, in Walden et al., there is nothing recited about the solution of the above problem. Hence, the results of these systems cannot be achieved and expected by Yoon combined with Lim and Walden et al. Therefore, Claims 1, 5, 9, and 16 are unobvious in view of the three references since there is an absence of a property which a claimed invention would have been expected to possess. This is evidence of unobviousness<sup>1</sup>. Since Claims 2-4, 8, 12, and 19 respectively depend on Claims 1, 5, 9, and 16, they are also patentable.

Similarly, the methods of Claims 20 and 24 utilize a multi-channel shared resistor-string DA converter and a plurality of filters, respectively. As discussed above, the results of the methods of Claims 20 and 24 also can not be expected by Yoon combined with Lim and Walden et al. Hence,

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<sup>1</sup> *Ex parte Mead Johnson & Co.* 227 USPQ 78 (Bd. Pat. App. & Inter. 1985)

the methods of Claims 20 and 24 are unobvious in view of the three citations. Since Claims 23 and 27 respectively depend on Claims 20 and 24, they are also patentable.

The Examiner also rejected Claims 5-7, 9-11, 13-18, 20-22, 24-26, and 28-30 under 35 U.S.C. 103(a) as being unpatentable over Yoon combined with Lim and Rhode et al. (U.S. Patent No. 5,841,382). As noted above, the results of Claims 5, 9, 13, 20, 24, 24, and 28 are not found in the combination of Yoon and Lim. Furthermore, Rhode et al. merely discloses a conventional DA converter instead of multi-channel shared resistor-string digital-to-analog converters. Since Claims 6-7, 10-11, 14-18, 21-22, 25-26, and 29-30 respectively depend on Claims 5, 9, 13, 20, 24, 24, and 28, they are also patentable.

### III. Conclusion

In view of the foregoing, Claims 1 through 31 pending in the application comply with the requirements of patentability define over the applied art. A Notice of Allowance is, therefore, respectfully requested. Applicant believes no fee is due with this response. However, if a fee is due, please charge our Deposit Account No. 50-0665, under Order No. 386998036US from which the undersigned is authorized to draw.

Dated: \_\_\_\_\_

9/24/04

Respectfully submitted,

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